

Amendments to the Claims

1. (Currently amended) A transgenic cell comprising a nucleic acid molecule ~~comprising a nucleic acid sequence~~ selected from the group consisting of:
 - i) a DNA molecule consisting of a DNA sequence as represented in ~~Figures 1a, 1b or 1c~~ SEQ ID NO: 1, 2, 3, or 4;
 - ii) a DNA molecule which hybridises to the sequences identified in (i) above and which encode a polypeptide which has fatty acid elongase activity; and
 - iii) DNA molecules consisting of DNA sequences that are degenerate as a result of the genetic code to the DNA sequence defined in (i) and (ii).
2. (Currently amended) ~~A~~The cell according to Claim 1 wherein said nucleic acid molecule anneals under stringent hybridisation conditions to the sequences described in (i), (ii) and (iii) above.
3. (Currently amended) ~~A~~The cell according to Claim 1 ~~or 2~~ wherein said nucleic acid molecules are isolated from an algal species.
4. (Currently amended) ~~A~~The cell according to Claim 3 wherein said algal species is ~~selected from the group consisting of:~~ *Amphidinium carterae*, *Amphiphora hyalina*, *Amphiphora* sp., *Chaetoceros gracilis*, *Coscinodiscus* sp., *Cryptocodonium cohnii*, *Cryptomonas* sp., *Cylindrotheca fusiformis*, *Haslea ostrearia*, *Isochrysis galbana*, *Nannochloropsis oculata*, *Navicula* sp., *Nitzschia closterium*, *Pavlova lutheri*, *Phaeodactylum tricornutum*, *Prorocentrum minimum*, *Rhizosolenia setigera*, *Skeletonema costatum*, *Skeletonema* sp., *Tetraselmis tetraethale*, *Thalassiosira nitzschioidea*, *Thalassiosira heterophorma*, *Thalassiosira pseudonana*, or *Thalassiosira stellaris*.
5. (Currently amended) ~~A~~The cell according to any of Claim[[s]] 1[[-4]] wherein said polypeptide is a variant polypeptide and comprises the amino acid sequence ~~represented shown~~ in ~~Figure 2a, 2b, or 2c~~ SEQ ID NO: 5, 6, or 7 which sequence has been modified by deletion,

addition or substitution of at least one amino acid residue wherein said modification enhances the enzyme activity of said polypeptide.

6. (Currently amended) ~~A~~The cell according to Claim 5 wherein said modified polypeptide has enhanced fatty acid elongase activity

7. (Currently amended) ~~A~~The cell according to ~~any of~~ Claim[[s]] 1[[-4]] wherein said polypeptide comprises the amino acid sequence represented in ~~Figures 2a, 2b or 2e~~ SEQ ID NO: 5, 6, or 7.

8. (Currently amended) ~~A~~The cell according to Claim 7 wherein said polypeptide consists of the amino acid sequence represented in ~~Figures 2a, 2b or 2e~~ SEQ ID NO: 5, 6, or 7.

9. (Currently amended) ~~A~~The cell according to ~~any of~~ Claim[[s]] 1[[-8]] wherein said cell is transfected with a nucleic acid molecules selected from the group consisting of ~~nucleic acid sequences selected from the group consisting of~~

- i) a DNA molecule consisting of the DNA sequence as represented in ~~Figures 1a, 1b or 1e~~ SEQ ID NO: 1, 2, 3, or 4;
- ii) DNA molecules which hybridise to the sequences identified in (i) above and which encode a polypeptide which has fatty acid elongase activity; and
- iii) DNA molecules comprising DNA sequences that are degenerate as a result of the genetic code to the DNA sequence defined in (i) and (ii); combined with at least one of the nucleic acid molecules selected from the group consisting of:
- iv) DNA molecules consisting of DNA sequences as represented in ~~Figures 3a, 4a, 5a or 6a~~ SEQ ID NO: 8, 10, 12, or 14;
- v) DNA molecules which hybridise to the sequences identified in (i) above and which have desaturase, acyl-CoA synthetase or diacylglycerol acyltransferase activity;
- vi) DNA molecules comprising DNA sequences that are degenerate as a result of the genetic code to the DNA sequence defined in (iv) and (v) above.

10. (Currently amended) ~~A-The~~ cell according to Claim 9 wherein said cell is a plant cell.
11. (Currently amended) A plant comprising ~~a-the~~ cell according to any of ~~Claims 1-10~~ 9.
12. (Currently amended) A seed comprising ~~a-the~~ cell according to any of ~~Claims 1-10~~ 9.
13. (Currently amended) A foodstuff product comprising ~~a-the~~ cell according to any of ~~Claims 1-10~~ 9.
14. (Currently amended) ~~A-The~~ foodstuff product according to ~~of~~ Claim 13, wherein said foodstuff is selected from the group consisting of: wine; beer; bread; baking products (e.g. bread, cake); or vegetable extracts.
15. (Currently amended) ~~A-The~~ food stuff according to Claim 13 wherein said foodstuff is wine or beer.
16. (Currently amended) A fermentation process comprising ~~a-the~~ cell according to any of ~~Claims 1-10~~ 9.
17. (Currently amended) ~~A-The~~ fermentation process according to ~~of~~ Claim 16 said process comprises the steps of comprising:
 - i) providing a vessel containing ~~a-the~~ cell according to the invention and constituents required for fermentation and fatty acid biosynthesis; and
 - ii) providing conditions conducive to the fermentation of ~~the~~ a liquid composition contained in said vessel.
18. (Currently amended) An animal feed product comprising ~~a-the~~ cell according to any of ~~Claims 1-10~~ 9.

19. (Currently amended) A method of modulating the level of n-3 fatty acid in a plant cell comprising;

- ii) providing a plant cell according to Claim 10;
- iv) regenerating the plant cell into a plant; and
- v) monitoring n-3 fatty acid production by said plant.

20. (Currently amended) A method for the production and optionally the extraction of n-3 fatty acids comprising:

- ii) providing a cell according to claim 1~~any of Claims 1-10~~;
- iii) providing conditions conducive to the growth of said cell; and
- iii) extracting n-3 fatty acids, or variants thereof, from said cell.

21. (Currently amended) A method for the production and optionally the extraction of n-3 fatty acid comprising:

- ii) providing a plant cell according to Claim 10;
- iii) regenerating said cell into a plant; and
- iii) extracting n-3 fatty acids, or variants thereof from said plant.

22. (Currently amended) A reaction vessel comprising ~~at least one cell according to the invention~~ the cell of claim 1, fatty acid substrates and co-factors characterised in that said vessel is adapted for the conversion of said fatty acids substrates to n-3 fatty acids.